APPENDIX D

DIGITIZATION

"Never forget that all technology can ultimately do is give your staff more time to think. It can't think for them. Data is not information. Information is not judgment. Judgment is not wisdom. Numbers aren't policy. Quantitative approaches can't solve qualitative problems."

Joshua Shapiro, Technology Consultant

Section I. INFORMATION TECHNOLOGY

D-1. INTRODUCTION

a. This appendix reflects and supports the doctrine for future Army aviation operations. It emphasizes the importance of synchronization of the digitized aviation task force (TF) through the real–time exchange of battlefield digital information. This rapid exchange of information will be accomplished through—

- Digital intelligence information.
- Digital mission planning and loading.
- Digital situational information.
- Synchronous command and control (C^2) of the battlefield operating systems.

b. The aviation TF commander and his staff will use this information to rapidly assess the tactical situation, maneuver to the decisive point on the battlefield, and destroy the enemy. To date, all digital experiments have confirmed that our doctrine is sound; they have shown that digital equipment allows us to plan, prepare, and execute better—but not necessarily faster. We have only scratched the surface on digitization, and the future holds great promise.

D-2. DEFINITION, GOAL, AND PURPOSE

a. A brief definition of digitization follows: *Digitization* is the application of information technology to acquire, exchange, and employ timely digital information tailored to the needs of each decider, shooter, and supporter, allowing a clear and accurate vision of the battlespace.

b. The Army's goal is to introduce modern information technology throughout the force in a way that optimizes capability. Today, the Army organizes units around

weapons systems —*''feeding the guns.*" In the near future, the Army will organize units to maximize information; that is, to create and share knowledge. Unified action will follow based on that knowledge, which will allow commanders to apply power effectively.

c. Our purpose will be to dominate, to control, and to win; information will be the means to a more powerful end. Information–based battle command will give the Army ascendancy and freedom of action for decisive results in 21st century warfare and peace operations.

D-3. ENHANCED CAPABILITIES

a. The digitally equipped aviation TF possesses significantly enhanced capabilities over the nondigitally equipped force. It electronically links air and ground forces allowing the commander to synchronize combat power with devastating effects. This integration is accomplished by the following seven aviation modernization programs—

- Global Positioning System (GPS).
- HaveQuick II (HQ II) UHF–AM radio.
- High Frequency Nap-of-the-Earth Communications (HF NOE COMM).
- Improved Data Modem (IDM).
- Aviation Mission Planning System (AMPS).
- Army Airborne Command and Control System (A^2C^2S).
- Aviation Tactical Operations Center (AVTOC).

b. What differentiates the digitally equipped force is the scope, intensity, and tempo of contemporary versus future operations brought on by the timeliness and accuracy of information provided by information age systems and sensors. Aviation information age systems reside at critical battle nodes. The Army's aviation operational architecture is composed of three information nodes. They are the AVTOC, A^2C^2S, and the collective fleet of modernized aircraft (OH–58D Kiowa Warrior, AH-64 Longbow Apache, and RAH-66 Comanche).

c. The AVTOC serves as the planning and primary synchronization point for the entire aviation operation. A^2C^2S focuses on the execution of current operations. It permits command and control on–the–move allowing the commander to influence action throughout the battlespace. The collection fleet of modernized aircraft uses data and imagery to conduct target acquisition and direct precision fires. Their sensors also create battlefield information that can be shared with commanders, other weapons systems, and intelligence providers.

d. The digitally equipped TF (Figure D-1) provides the commander—

- Increased situational awareness and sensor–to-shooter links.
- Enhancements to the mission planning process, orders preparation, intelligence flow, and distribution process.
- Digital aids that enhance the timeliness of tactical decisionmaking.
- Synchronized fire support.

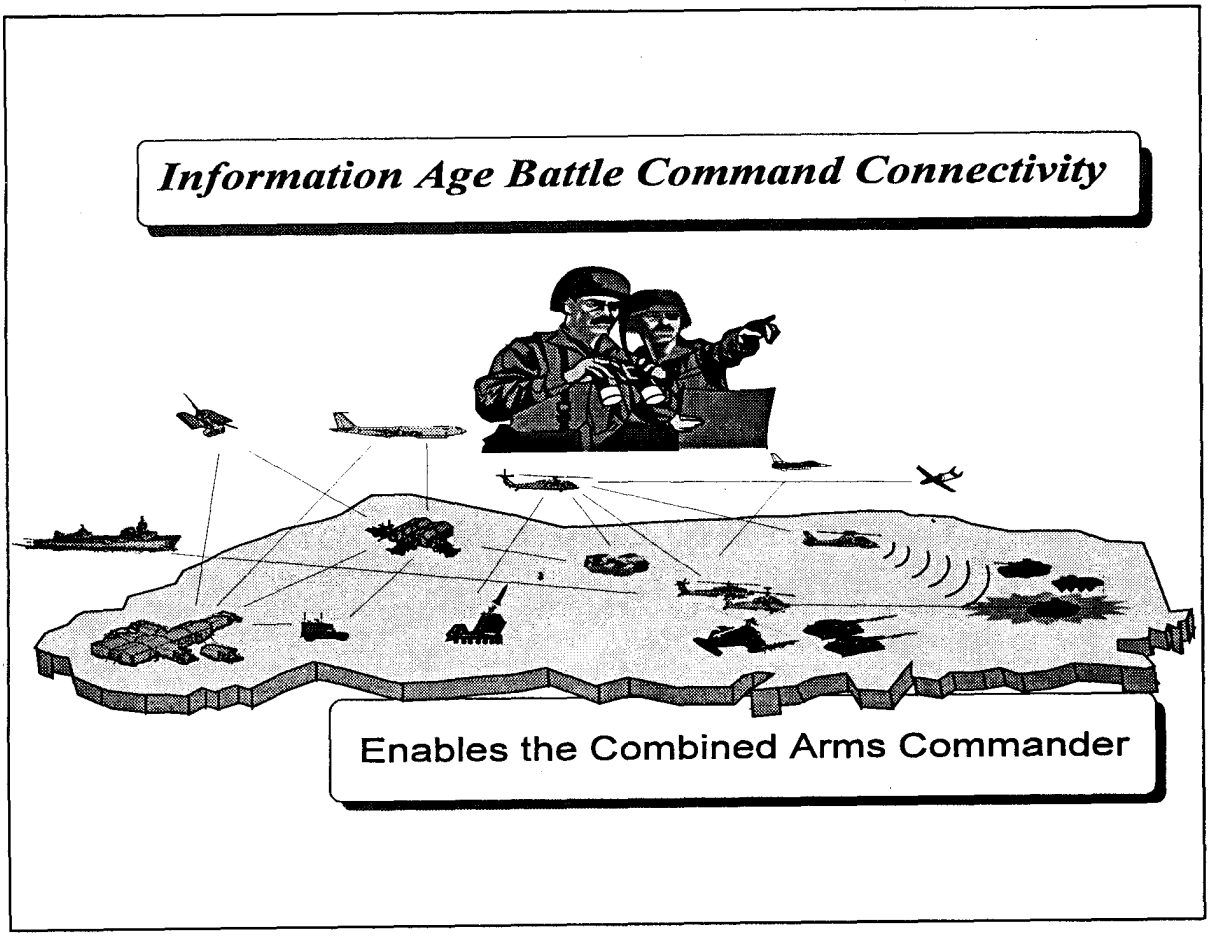

Figure D-1

D-4. SITUATIONAL AWARENESS

The increased situational awareness that the following systems and other digital systems provide the commander significantly enhances C^2: A^2C^2S, the Aviation Tactical Operations Center (AVTOC), the Enhanced Position Location Reporting System (EPLRS),

and the AMPS. By observing the displays on these systems, the commander can see situational depictions of both the friendly and threat forces. With the aid of the GPS in the cockpit, the commander can instantaneously now know his precise location.

D-5. PUNNING PROCESS

a. The AVTOC—equipped with digital systems such as All Purpose Analysis System–Warrior (ASAS–W) and AMPS-provides significant enhancements to aviation mission planning and execution. The aviation TF commander and staff can issue warning orders with draft operations overlays early in the orders development process. This enhancement should allow subordinate commanders to begin their troop–leading procedures, rehearsals, and reconnaissance much earlier than previously possible. Digital information is exact. All subordinate elements receive exactly what is sent by higher headquarters. This reduces many human errors such as transposing grid coordinates.

b. When the staff has completed the planning process, and is ready to issue the operation order (OPORD), they digitally update and send the operational graphics before the issuance of the order. This allows subordinate units to initiate additional detailed planning while the commander is away receiving the OPORD. Mission, enemy, terrain, troops, and time available (METT–T) and creativity determine how a unit can most effectively use the digital systems available to them.

D-6. REPORTING

a. The ability to send tactical reports digitally helps the commander to shape the battlefield and react to the changing tactical situation. Pre-formatted reports via the improved data modem (IDM) allow the commander to assess the information reported. Spot reports (SPOTREPs), situation reports (SITREPs), and battle damage assessment (BDA) reports are just a few of the digital reports. These reports can be sent *"broadcast"* to everyone on the net or *"addressed"* to only those with a need to know.

b. Grid locations in the reports are more accurate since they are obtained from digital sources, i.e., GPS or locating laser targets. Routine reports can be formatted before the mission to reduce the time it takes to compile the report in flight. Sending digital imagery or graphics with a report may enhance the quality of the report. For example, an OH–58D pilot sends a BDA report with text and a digital image of the degree of destruction; an AH-64D pilot sends graphics files from his radar sweep to subordinate team members to assign sectors of fire.

D-7. LIMITATIONS

Digital systems and their use do have limitations despite their numerous advantages. Some of these limitations can have significant effects. A good backup plan should always be rehearsed. Some of these limitations include, but are not limited to, the following:

1. Some key elements of the task force, such as CS or CSS units, may not be equipped with digital systems.

Mixing digital and nondigital units in the same TF presents a special challenge to the TF commander and staff. Procedures must be established to communicate and share information. Control measures used on digital overlays must match those on conventional hard copy overlays.

2. Physical limitations of the hardware or software.

Each version of software may have different capabilities. For example, one version of AMPS may allow only a certain number of waypoints to be entered. Limitations of the hardware may include memory capacities, processing speed, or printed output. Large graphics files may slow down digital transmissions to the point at which they may become counterproductive. In some cases, voice reporting may be more expedient and digital reports are used for follow–up reports. The commander must decide when digital is better. Digital communications links may be interrupted.

3. Digital communications nets require precise procedures and strict net discipline.

Combining digital, voice, and imagery/graphics transmissions on the same net requires strict discipline. If communications net allocations permit, separate nets for voice and digital may be desired. Frequency hopping radio setup in HaveQuick II (HQ II) and single channel ground and airborne radio system (SINCGARS) requires precise entries. Use of a data loader or electronic fill reduces setup errors. Using GPS to time-frequency hopping is the preferred method to synchronize the net.

4. Digital to nondigital information/data exchange (and vice versa) requires additional time, manpower, and resources.

While one unit may use AMPS and a trackball to point and click a digital map to get grid coordinates, a nondigitized unit must still manually plot grids with a protractor. An aircraft that does not have a data transfer device requires the crew to *"fat finger"* in information such as navigation waypoints, which increases mission launch time and fuel burn during runup.

5. The availability of digital map terrain data bases may limit use of the systems.

The Defense Mapping Agency (DMA) produces digital map products on a priority set by Department of Defense (DOD). While most of Southwest Asia maps may be available in digital form, the small island country in one of your contingency plans may not. This is not an aviation–unique problem. DMA is updating its library of digital maps based on the proliferation of digital systems emerging on the battlefield.

6. GPS coverage and accuracy due to jamming or spoofing.

While GPS may be the best system ever invented for navigation, relying solely on GPS without a backup form of navigation (conventional navigation aid (NAVAID), time distance, and heading computations) is not prudent. GPS signals and accuracy depend on factors such as the number of satellites being tracked, constellation orbit, or coding of the signal.

7. Automation skills, such as typing and basic computer skills, as well as operational knowledge, are critical.

Use of digitized systems requires basic skills such as typing. Faster typing means faster data input. Basic knowledge of computer operations such as file management and system operations is essential.

8. The tactical internet may be limited in the volume of data that can be passed.

If too much data is passed, the net could collapse.

Section II. DIGITAL SYSTEMS AND EQUIPMENT

D-8. DESCRIPTIONS OF CURRENT DIGITAL SYSTEMS

This section contains brief descriptions of the current aviation digital systems. For detailed descriptions and technical data, refer to the appropriate system operator's manual.

a. ***AH-64D Longbow Apache (LBA).***

(1) The Longbow system consists of the AH-64D aircraft; provisions for an integrated milimeter wave (MMW) fire control radar (FCR), mounted on top of the Apache's main rotor mast; and the RF Hellfire missile. Not all AH-64Ds will have the MMW radar attached; however, all will be configured to accept the radar. In addition, the AH-64D contains the radio frequency interferometer (RFI) for precise threat system acquisition. The Longbow Apache is able to detect, classify, prioritize, and engage targets with Longbow Hellfire missiles without visually acquiring the target.

(2) The LBA will provide increased data transfer capabilities such as SPOTREPs, SITREPs, battle damage reports, target handover, and real–time images of the battlefield with use of the IDM. The IDM is a tri-service device that offers backward capability to the OH–58D airborne target hand-over system (ATHS) and tactical fire (TACFIRE).

(3) With TACFIRE integration, the Longbow can send target information to the entire TACFIRE net for immediate suppression. Besides target handover, the IDM

provides the capability to send fragmentary orders (FRAGOs); enemy/friendly location updates; graphic updates and changes; and any other pertinent information from the commander to the Longbow Apache company/team-or from LBA to commander—while en route to or in the battle position. This timely exchange of information reduces the time of manually plotting information and increases operational tempo, allowing the commander to shape the battlefield.

(4) The data transfer module (DTM), mounted in the Longbow Apache, is used to quickly upload the mission data and initialize aircraft systems for the mission. Data can be loaded into all aircraft or loaded into the first aircraft and transmitted via the IDM to all other aircraft in the mission. When the mission is complete, the DTM retains all mission data debriefing information to carry back to the AMPS for the debrief. In addition, the DTM provides the maintenance section with data for troubleshooting, reducing maintenance downtime.

b. ***OH-58D(I) Enhanced Kiowa Warrior.***

The Kiowa Warrior is a digitized platform. In addition to the digital systems integrated into all OHW–58D(I)s, the Kiowa Warriors taking part in the TF XXI advanced warfighting experiment (AWE) will have the following digitized systems installed:

(1) ***Embedded GPS in an inertial navigation system (EGI).*** The EGI replaces the current doppler/attitude heading reference system (AHRS) combination; it provides increased navigation accuracy.

(2) ***Improved master controller processor unit (IMCPU).*** The IMCPU provides a new digital map display on the multifunction display (MFD). The IMCPU also provides the processing power and memory necessary for integration of the other aircraft upgrades.

(3) ***Improved data modem (IDM).*** The IDM is the Kiowa Warrior's link to the digital battlefield. It replaces the ATHS of the existing Kiowa Warrior; it allows digital data to be transferred over the frequency modulated (FM)I, FM2, ultra–high frequency (UHF), and very high frequency–amplitude modulated (VHF–AM) radios using either TACFIRE or variable message format (VMF) messages.

(4) ***SINCGARS system improvement program (SIP) radio.*** The SINCGGARS SIP replaces the FMI and FM2 radios and the associated data rate adapters (DRAs) in the current Kiowa Warrior. The SINCGARS SIP radio provides faster data communication in a jamming or high–noise environment.

(5) ***Video image crosslink (VIXL).*** The VIXL provides the Kiowa Warrior with the capability to send and receive still frame images over one of the FM radios. The VIXL consists of a circuit card installed in the IMCPU. VIXL ground stations will consist of an AMPS with a tactical communication interface module (TCIM) and a SINCGARS radio. The ground stations will be used to transfer VIXL images on the ground.

(6) ***Improved mast-mounted-sight system processor (IMSP).*** The IMSP is a direct replacement for the existing mast–mounted–sight system processor (MSP) in the Kiowa Warrior. The IMSP provides enhanced targeting through—

- Improved tracking lock-on and reacquisition.
- Television (TV)/Thermal image sensor (TIS) split screen; i.e., provides TV and TIS images on the same display page.
- Auto cue-detects and highlights moving targets.

c. ***Aviation Mission Planning System (AMPS).***

(1) AMPS is an automated aviation mission planning/rehearsal/synchronization tool designed specifically for the aviation commander. The two levels of AMPS are brigade/battalion and company. Each level provides the automated capability to plan, rehearse, and synchronize aviation missions.

(2) The brigade/battalion AMPS is hosted on the common hardware/software II (CHS II) platform. The platform consists of a TCU with 128 megabytes (MB) of random access memory (RAM); a 4.2–gigabytes (GB), removable, hard-disk drive; a compact disk–read only memory (CD–ROM) drive; a 1.3–GB, magneto, optical drive; a 19–inch color monitor; and a character graphics printer. The company AMPS hardware also will be hosted on a CHS II or portable, lightweight computer unit (LCU). All of these components are ruggedized for field use.

(3) In addition, the AMPS has an internal 9600 baud modem. AMPS software contains a modem applet, allowing two AMPS to transfer data files over telephone lines. (A secure STU–III phone must be used if transferring classified data.) Longbow Apache and OH–58D Kiowa Warrior AMPSs have a data transfer receptacle and data cartridge for loading/downloading mission data in the aircraft.

(4) The functions of AMPS can be broken into three areas: tactical planning, mission management, and maintenance management functions. The tactical planning function includes planning tasks normally performed at the brigade/battalion level, such as intelligence data processing; route planning; communication planning; navigation planning; and mission briefing/rehearsal.

(5) The mission management function can be associated with planning that occurs at the company/aircrew level. These tasks include aircraft performance planning; weight and balance calculations; flight planning; crew endurance planning; and OPORD/OPLAN changes. The company system will also be capable of mission briefing/rehearsal.

(6) The maintenance management function if provided primarily for the unit–level maintenance section. This section will permit the downloading of mission data to maintenance personnel.

(7) AMPS data is saved onto a data transfer cartridge (currently 256 kilobytes (KB)), which is used to upload mission data to the host aircraft (AH-64D and OH-58D Kiowa Warrior) via the data transfer module. (Note: the Force XXI Kiowa Warrior will use a 40–MB cartridge to hold digital map data bases.) The data created at battalion level is given to the company level for detailed company and aircrew planning. Integrated into IDM functions, the AMPS will allow information and graphic updates between aircraft, the A^2C^2S, and the AVTOC. Printed hardcopy output products will include weight and balance forms, strip maps, flight plans, OPORDs, route navigation cards, and communications cards.

(8) AMPS map data bases are created from arc digitized raster graphic (ADRG) CD–ROM and digital terrain elevation data (DTED) media available from the DMA. The maps contained on the CD–ROMs are digitally cut and pasted for a particular area of operation; they are stored for ready access on the magneto optical drive disks or the AMPS hard drive. Data bases of different areas of operation or various scale maps can be maintained and organized on disks.

(9) AMPS can be used for detailed terrain analysis; for example, intervisibility line of sight between a battle position and an engagement area. Using the perspective view feature, pilots can gain a feel for prominent terrain along the route to be flown.

(10) AMPS is a standard International Business Machine (IBM)-compatible system. AMPS software uses the UNIX operating system with X–windows environment and a Motif graphical user interface. AMPS has many ports on the back panel that will accommodate commercial, off-the-shelf computer peripherals such as laser printers, mouses, external monitors, or scanners. Some units use the AMPS for more than a mission planner. By using additional removable hard drive and system setups, many units use the AMPS as a reconfigurable tactical work station for word processing, graphics, and data communications. Some units have even obtained commercial video projection devices to project the AMPS display in large–screen format for tactical briefings.

(11) It is important to note that the AMPS in use today is not the objective AMPS. The AMPS currently fielded does not have all the capabilities mentioned because of current hardware and software limitations.

d. *Army Airborne Command and Control System (A^2C^2S).*

(1) The A^2C^2S is a UH–60 Black Hawk with a console of common networked computers, combat net radios (CNRs), and HaveQuick UHF radios. Satellite communications (SATCOM), HF radios, and a large digital map display on a flat panel screen. This system is used by commanders as a highly mobile C^2 platform.

(2) The A^2C^2S will provide real–time situational awareness and mission planning capability. The A^2C^2S requirement is an extension of the current airborne C^2 capability; it is the airborne variant of the command and control vehicle (C^2V) program. The helicopter

(UH–60)–based C^2 system will provide the commander an airborne C^2 capability—with voice and data equipment. The capability provides battlefield information processing and connectivity equivalent to the tactical command post and the battle command vehicle (BCV) while static or airborne.

(3) Staffing in the A^2C^2S will vary with mission requirements. The system will provide the corps, division, ground maneuver brigades, and attack helicopter battalion commanders with a mobile air vehicle; the vehicle will possess sufficient capability to acquire and communicate critical information at all times. The system will provide the commander an immediate, mobile C^2 node for early entry operations. The airborne C^2 system must fully interoperate with joint and allied forces; the ground commander's combat vehicle (CV); BCVs; corps and below components of the Army tactical command and control system (ATCCS) / Army battle command system (ABCS); and special operation forces C^2 systems.

(4) The A^2C^2S has the capability to communicate and exchange information and graphics with all elements of the battle, such as Longbow Apaches, en route to or in the battle position (BP); ground commander and elements; overhead intelligence sources (joint surveillance target attack radar system (JSTARS); unmanned aerial vehicle (UAV)); fire support element; close air support (CAS); and any other element with the same equipment.

(5) Finally, in peace and humanitarian operations, the system will provide connectivity with civil and / or host nation information / communication networks.

e. ***Aviation Tactical Operations Center (AVTOC).***

(1) The AVTOC is a high–mobility, multipurpose wheeled vehicle with a standard, integrated command post rigid wall shelter, and high–mobility trailer. Aviation brigades, battalions, and separate companies use it to plan and control their forces on the digitized battlefield. It is an integrated system wherein the maneuver control system, aviation mission planner—brigade and below—C^2 exchange data files are connected to a suite of radios and modems. It receives, interprets, parses, and correlates messages from combined arms and joint sources. The AVTOC consists of operations work stations; intelligence work stations; mission planning work stations; reconfigurable work stations, with situational displays; and a large–screen projection system. The communications rack in the vehicle contain VHF AM; UHF AM; VHF FM SINCGARS / SIP; UHF AM HQ II; SATCOM; and HF NOE COMM radios.

(2) In the AVTOC, the aviation commander and his staff coordinate and execute the combat operations in progress; plan future operations; conduct debriefs of crews; and prepare reports for higher headquarters. The division plans and orders will come to the aviation brigade through common computers and nodes to the AVTOC.

f. ***Improved Data Modem (IDM).***

(1) The IDM is used on the A^2C^2S, the AH-64D, the OH-58D Kiowa Warrior, and in the AVTOC. The IDM is a modem that passes targeting or situational awareness information to and from airborne or ground platforms (digital and analog). The IDM contains two modems—which support four links—and one generic interface processor used for link/message processing. (Link formats include TACFIRE, AFAPD, and MTS.)

(2) The IDM provides a demonstrated interoperable capability between the US Air Force, Army, and Marines in pursuit of the digitization of the battlefield. The IDM provides digital connectivity that was previously not available with a low-cost, small–size, and weight design. The IDM can operate simultaneously analog (CPFSK, FSK), digital (ASK), and secure digital (KY-58). The IDM's flexible design is easily adaptable to enable net link and message formats. It is further hardware and software expandable.

g. ***Maneuver Control System (MCS).***

(1) Maneuver control system allows the tactical commander to build a common picture of the battlefield overlayed on DMA digital maps. It has the capability to synchronize battle plans and planning based on near real–time information and assessments from staff and subordinate commanders.

(2) With appropriate communications support, the system displays information and provides the capability to interactively develop the battlefield picture. As a result, the commander is able to make timely decisions and communicate those decisions in graphical formats to higher, adjacent, and lower units. MCS provides the commander and staff the necessary tools for planning, operations order development, and the execution of the battle.

h. ***All Source Analysis System (ASAS).***

(1) ASAS is the IEW component of the Army tactical command and control system (ATCCS) from EAC to battalion. It is a computer–based intelligence and electronic warfare processing, analysis, reporting, and technical control system. ASAS receives, and rapidly processes, large volumes of combat information from multiple sources to formulate timely and accurate targeting information, intelligence products, and threat alerts. It consists of evolutionary sets of hardware and software modules. ASAS provides system operations management; system security; collection management; intelligence processing and reporting; high–value/high-payoff target processing and nominations; and communications processing and interfacing.

(2) ASAS automation provides the G2/S2 and the analysis and control organization of the echelon the means to complete the many analysis tasks required by the IEW functional area as well as those doctrinal missions, tactics, processes, and procedures required by users in various MI organizations. One of these functions is the maintenance

of force level data for use by all BFA. This is accomplished at the collateral security classification level by the ASAS Remote Workstation (RWS). The ASAS RWS is manned and operated by the G2/S2 personnel of the echelon; it depends on the products of the highly automated ASAS subsystem supporting the echelon analysis and control element (ACE). All parts of the ASAS are under the OPCON of the G2/S2 of the echelon.

(3) At corps and division, two ASAS RWSs are located at the main command posts. They provide automated intelligence support to the G2 plans and operations staff elements; they also operate as the technical control portion of the IEW C^2 node of the ATCCS. They provide current IEW and enemy situation information to the force level control (FLC) data base for access and use by other ATCCS/FLC subscribers.

(4) At brigade and below, two RWSs are provided to the analysis and control team of the MI direct support company supporting the divisional maneuver brigade. In addition, one RWS is provided to each brigade and battalion S2. These RWSs operate at the collateral security level; they perform the same relative IEW/S2 and ATCCS functions as the division ACE and G2 RWS.

i. *Enhanced Position Location Reporting System (EPLRS).*

(1) EPLRS is a radio system that provides a robust, transparent, digital communications network with features such as automatic data relay and automatic data reroute. Through time domain multiple access (TDMA) architecture, the EPLRS network is able to accommodate the varied data throughout requirements of multiple users on the battlefield. Through automatic position updates, an individual user of the EPLRS network can be informed of the location of other EPLRS network users. The A^2C^2S will be the only Army aviation aerial platform equipped with EPLRS, although the AVTOC will have it on the ground.

(2) Through the EPLRS established network, the system serves as a situational awareness terminal and brigade data processor. It can graphically display the position of other net users as well as their air tracks (locations). As a brigade data processor, it allows the user to send data messages to other users of the network. Together, EPLRS and situational awareness host software provide a reliable means of acquiring situational awareness information and exchanging data messages.

j. *Appliqué.*

(1) Appliqué is a system designed to give nondigital systems—air and ground—a strap-on system to digitally interface with other fielded digital systems. It is the primary communications device for the tactical internet. An Appliqué typically will consist of a communications router, a SINCGARS SIP radio, and application software. The Applique will be system dependent. The software uses a windowing system based on X–Windows and a graphical user interface (GUI) that is Motif compatible.

(2) The Appliqué software covers five functional areas:

- Situational awareness.
- Communications management.
- Execution of battle command.
- Supporting battle command.
- Interfaces to battle command.

(3) The situational awareness software provides highly accurate, near real–time situational data and enhanced graphic/visual presentations to provide real–time awareness of the changing situation.

(4) The communications management software will provide a highly flexible, dynamic networking capability that addresses and routes messages with little or no user intervention. It also monitors all communications networks connected to the appliqué.

(5) The battle command execution software will provide the capability to conduct battle command with minimal user interface. It allows rapid creation of maneuver, intelligence, CSS, obstacle, and fire support overlays. It also transmits and receives overlays and messages.

(6) The battle command support software will provide the user with CS and CSS capabilities and the ability to extract information from higher commands' messages.

(7) Finally, Appliqué software will have interfaces with sensor systems that allow the transmission, reception, and display of sensor information. These interfaces will include—

- Dismounted soldier system (DSS).
- Imagery.
- Battle combat identification system (BCIS).
- Intravehicular information system (IVIS).
- All source analysis system (ASAS).
- Advanced field artillery tactical data system (AFATDS).
- Maneuver control system (MCS).

- Forward area air defense command, control, communications, and intelligence system (FAADC^{3}I).
- Combat service support control system (CSSCS).

k. ***Advanced Field Artillery Tactical Data System (AFATDS).***

(1) The US Army Field Artillery School developed the advanced field artillery tactical data system (AFATDS) to control fire support operations. The corps or division artillery brigade formulates the fire support plan; it disseminates this plan through the MCS computer via the area common user system (ACUS).

(2) These communications are mostly digital, using modems and the message formats of AFATDS or the VMF.

l. ***Forward Area Air Defense Command Control, Communications, and Intelligence (FAADC^{3}I) System.***

(1) The US Army Air Defense Artillery School has developed the FAADC^{3}I system. The FAADC^{3}I provides an overlay of battery coverage areas to the MCS computer via ACUS. The FAADC^{3}I system takes information from Air Force, Navy, national, and organic systems to formulate an air picture.

(2) This air picture is too short lived to be of any use in the planning function. It is not, therefore, transmitted on the MCS computer and communications network. Instead, it will be transmitted over EPLRS throughout the FAADC^{3}I network and retransmitted within the local area users network via EPLRS.

m. ***Combat Service Support Control System (CSSCS).***

(1) The US Army Combined Arms Support Command has developed the combat service support control system (CSSCS). The CSSCS is a computerized system for the control of most classes of supplies and equipment and personnel replacements.

(2) It interfaces with the standard Army management information system (STAMIS), which is a series of software programs, such as standard installation division personnel system (SIDPERS), financial systems, etc.

n. ***HaveQuick II (HQ II).***

(1) HaveQuick II is a ground or airborne UHF radio system that is modified to incorporate an electronic counter–countermeasures (ECCM) capability.

(2) A timing signal from an external source maintains synchronization for frequency hopping communications.

o. *High-Frequency Nap-of-the-Earth Communications (HF NOE COMM).*

High–frequency radios will provide long–range, non–line-of-sight secure and non–secure communications between Army aircraft, AVTOCs, and ATS facilities. They also will provide digital transmission of GPS data to improve the commander's situational awareness.

SECTION III. DIGITALLY EQUIPPED ORGANIZATIONS

The Aviation Restructure Initiative serves as the organizational foundation for all digitally equipped aviation units.